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ABSTRACT

Providing a variety of instructional methods and materials, developing unique and effective communication systems, and continually evaluating the process are the keys to the effective delivery of field-based programs in graduate education offered by Nova University (Florida). It has become a leader in distance-education programs by offering off-campus undergraduate and graduate degree programs in education, business and public administration, psychology, and computer sciences. Almost half of the students are enrolled in field-based programs that are delivered in a number of ways, including the National Cluster approach of the doctoral program in Child and Youth Studies (CYS). The various forms of technology used for program delivery include the autobridge (a telephone technology), videotapes, audiotapes, telephone, electronic mail, and the electronic classroom (simultaneous online classes). A study of the effectiveness of the CYS National Cluster approach is being conducted to compare the effectiveness of its delivery methods and practicum approach (infrequent cluster meetings and more reliance on technology) with more traditional methods of distance education. Nova University recognizes the need to keep abreast of technology and to provide the latest valid delivery approaches for its distance learners. (Contains 5 references.) (SLD)

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"The Use of Multiple Technology Resources in a Distance Learning Doctoral Program"

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The Use of Multiple Technology Resources in a Distance Learning Doctoral Program

INTRODUCTION:

> The next generation of educational programs -- called *online education* or *computer-based distance learning* -- is anything but dull and hackneyed. This is education on the brink -- technology tapped and harnessed to bring learning to people too busy to attend traditional school or who don't have access to conventional campus environments.
>
> (Roberts, 1991, p.19)

The delivery of graduate education to a student who resides at a distance from the home campus is more than simply getting information from the university to the student. To be effective, it must provide students with information in a variety of formats, use a variety of stimulus materials, provide instructor feedback to students through a variety of sources, and seek reactions from students to the delivery process in a variety of ways. Variety is a major key to enriching the distance delivery system.

Communication is also an important factor in distance education. In addition to a variety of instructional delivery methods, unique means must be developed and used to enable students to communicate with each other and with the professor. This is especially important, because students and faculty are not in direct proximity to one another. The effectiveness of such a delivery and communication system is also important. Providing that variety of instructional methods and materials, developing unique and effective communication systems, and continually evaluating the process are keys to the continued delivery and effectiveness of the field-based programs in graduate education offered by Nova University.

THE UNIVERSITY:

Nova University, a 4-year nonprofit, fully accredited, educational institution, is located in Fort Lauderdale, Florida. Founded in 1964, Nova is an acknowledged leader in distance education programs, offering off-campus undergraduate and graduate degree programs in education, business and public administration, psychology, and computer sciences. These degree programs are delivered through a variety of instructional modes, including field-based and electronic delivery.

Nova University's main campus is located on a 200-acre site. Nova's "national campus" extends throughout Florida at 76 sites in 28 cities, to 72 sites in 22 other states, and to four international locations. The Nova plan stresses the critical relationship between theory and practice; it reinforces and tests the classroom experience through applied research and community service as integral parts of the academic experience. Consistent with its mission, Nova University extends its

resources to provide educational opportunities to working professionals nationwide, with faculty teaching at corporate sites and other locations across the country. Nova also delivers programs through a variety of educational technologies, including telecommunications. The University is committed to the idea that education should not be timebound or placebound and uses a variety of educational technologies.

Nova University has been accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (SACS) since 1971 and received its latest 10-year reaffirmation of accreditation by SACS in 1985. In both instances, accreditation fully encompassed Nova's distance education programs. Nova is accredited to award bachelor's, master's, educational specialist, and doctoral degrees. Nova University meets regulations that govern the provision of distance education programs by nonresident students in 30 states. The University is alma mater to more than 30,000 graduates of various programs who live in all 50 states. Included among its alumni are 27 college presidents and chancellors, 114 college vice-presidents and deans, a state commissioner of education, 9 superintendents of the nation's 47 largest school districts, 4 State of Florida Teachers of the Year, the chairperson of the Florida Education Standards Commission, judges, attorneys, a state legislator, corporate executives, entrepreneurs, and other leaders and officers of public and private organizations.

FIELD-BASED PROGRAMS:

Almost one-half of Nova's 12,000 students are enrolled in field-based programs. These programs are delivered in a variety of ways ranging from regional cluster locations where students meet once a month for all-day Saturday classes with the professor flown in by Nova, to the student working at home using a personal computer and modem to communicate electronically over a regular phone line.

NATIONAL CLUSTER:

The Ed.D. Program in Child and Youth Studies utilizes both the regional and computer-assisted formats described above. The computer-assisted format, referred to as the National Cluster approach, uses a combination of the standard cluster approach as well as electronically delivered interaction. Students in this format meet twice a year for a 3 to 5-day period to interact with the professor responsible for a specific study area. During the following 3 to 4 months, students and faculty interact through the use of various technological resources and online tools supported by telecommunications.

ONLINE TOOLS AND RESOURCES:

Various forms of technology are used to bring instruction and learning opportunities to the students. These include the use of an audiobridge, videotapes,

audiotapes, the telephone, electronic mail (email), the electronic library, Electronic Classroom (ecr), and the Writers Workbench (wwb). Each is briefly described below:

- Audiobridge
  A technique that enables students to call a central, toll-free number from their home telephone and be connected with their instructor and classmates for a two-way discussion period on a pre-specified topic. The institution receives a bill for all of the long-distance connections and for use of the audiobridge technology.

- Videotapes
  Traditional half-inch VHS videotapes are prepared in the Nova TV studio and duplicated for loan to the students. These are viewed in the home and then discussed online, in the audiobridge, or at the various "live" class sessions. Recent tapes have included a greater degree of student involvement, directing students to stop the tape every 15 minutes or so and complete various activities.

- Audiotapes
  Although not used extensively, some commercial audiotapes and some tapes of Nova sessions have been duplicated and shared with the students for home listening. Greater use may be made of this medium in the future. Not only is this an economical medium, but students like to have tapes for review in their cars and home tape players.

- Telephone
  Although rather traditional and low tech, the telephone enables faculty and students to enjoy one-to-one contact for specific discussions or clarification. Students can call on a toll-free number when they have questions or need extra help.

- Electronic Mail (email)
  All students in the National Cluster must have access to a personal computer and modem to participate in this electronic approach. As might be expected, much of the two-way interaction between students and faculty (and between students) occurs through the use of email. A major advantage of email over the telephone is the reduction of "telephone tag." The message you leave with email can be answered by the recipient whenever they find it convenient to log on. The instructor can reply with a stroke of a key, virtually assuring rapid response. Indeed, the instructor can set up an alias (group of addresses) and mail one message to an entire class as easily as writing one student. The amount of communication is generally enhanced through the use of email.

- Electronic Classroom (ecr)

  Perhaps the most unique feature of Nova's online delivery system is the ability to simulate an actual class setting while the students participate from their homes located almost anywhere in the world. In 1985, Nova staff created the "Electronic Classroom." Utilizing the Unix system, it provides an electronic forum in which teacher and students interact simultaneously. Two-thirds of the screen is allotted to the teacher to display previously prepared material, or to enter questions and comments in real time. One-third of the screen displays the names of students who have logged into the class. The use of that portion of the screen is given to a student when "called on" by the teacher. Thirty or more students can interact simultaneously with their faculty and classmates using the computer screen as their "virtual classroom."

  Students enter the room, take seats, observe the information provided by the professor, ask or answer questions, are called upon, receive comments back from the professor and classmates on their contributions, are tested, and so forth. A professor might divide the class into three or four smaller groups and send them electronically to other ecrs for small group discussions. Then, when the total group gathers back together in the main classroom, the leader of each group gives a summary of their discussions.

EFFECTIVENESS OF ELECTRONIC DELIVERY FOR THE CYS PROGRAM:

While the use of electronic media has received acceptance from much of the educational community, there is to date insufficient data to prove or disprove the educational value of these media. In a study reported by MacFarland (1990) concerning the efficacy of ecr, subjects viewed the medium as being "superior to traditional instruction in view of access and equivalent to traditional instruction in view of learning behaviors and outcomes" (p. 13).

The Programs for Child and Youth Studies has embarked on a much broader study, encompassing not only the effectiveness of electronic media (particularly email and ecr) in the delivery of instruction, but also a comparison between the National Cluster delivery method and the traditional cluster, in which all instruction is presented in the classroom. The basic question the study seeks to answer:

Is the high tech delivery system used by the National Clusters as effective as the traditional delivery system used by the field based clusters?

Four distinct groups of participants are involved in the study. Cluster A is a field based model, Cluster B a technology-based model. Field based Cluster C is the control for Cluster A, technology-based Cluster D is the control group for Cluster B.

Four distinct groups of participants will be involved in the study. Clusters A and B, based in Fort Lauderdale, began within two weeks of each other in February 1992. Cluster A is a site-based model; Cluster B is a technology-based model. The instructors who teach Research and Evaluation, Human Development, Technology, and Political Processes and Social Issues are the same for both groups. The only exception is in the Leadership study area, where the same duplication is not possible. Site-based Cluster C from another location is the control for Cluster A, and technology-based Cluster D, that began in October 1992, is acting as a control group for Cluster B. No effort is being made to match the faculty assigned to Clusters C and D with either Cluster A or B.

In the course of this evaluation, three separate studies will be conducted using distinct outcome variables as additional criteria for evaluating the program. Study 1 considers knowledge outcomes of study area content. An objective achievement test will be used in this study, consisting of a pre- and posttest assessing entrance/exit knowledge of study area material. The research design is quasi-experimental as the groups are intact, thereby allowing no random assignment. The design of this study can be depicted as follows:

O_1	X_1	O_2
O_1	X_2	O_2
O_1	X_3	O_2
O_1	X_4	O_2

*O_1 and O_2 = pretest and posttest.
*X_1, X_2, X_3, and X_4 = treatment groups.

The post test performance of the four treatment groups will be compared using a oneway analysis of covariance. The pretest will serve as a covariate to control for initial group differences in knowledge content. Type of program delivery will be the dependent variable.

Study 2 will consider performance on introductory and major practicums. A comparison will be done to compare the performance of students in terms of their abilities to design and implement two practicum assignments. All four phases of the practicum experience will be included in the study. The four phases for both introductory and major practicums are: the preliminaries, the proposal, the implementation, and the report. Practicum advisers will document the frequency of faculty-student interactions, the number of proposal rewrites, and the adherence to deadlines. A comparison will be made of each of these areas as well as a comparison of final grades.

The third study will consider student perception of study area mastery. A student rating form will be administered at the completion of each of the study areas within the program. Items will be based on study area learner objectives. Using a Likert scale, students will indicate the degree to which they perceive they have achieved mastery of a given objective. A comparison will be made within groups as well as between groups to determine which course objectives students perceive as having learned.

Since the evaluation is longitudinal in design, an interim report is scheduled at the end of year one and again at the end of year two. Information contained in each of the interim reports will reflect that data which is available for analysis upon the completion of each year of the project. The first interim report is currently in process and should be ready for dissemination by September of 1993.

Initial findings indicate that students in the two national clusters scored significantly higher that their field based counterparts on the pretest administered to all students at the start of their respective programs. This holds true for the separate sections of the pretest. National Cluster students scores were higher that field based students for those sections that addressed research skills, and the study area content of Leadership, Research and Evaluation, Technology, Human Development, and Political Processes and Social Issues.

National cluster students, on average, achieve higher grades across study areas and perform better on individual class assignments. In general, students in all four clusters rated their respective faculty in a similar manner on evaluation forms completed at the end of their courses.

PROJECTIONS FOR FUTURE DIRECTIONS:

Although the use of computers, audio and videotapes, and the mailing of computer disks seem to be most appropriate for the delivery of distance instruction into the home today, we anticipate changes in the near future. The potential of multimedia resources for those who can accept the challenge of constantly changing technologies holds great promise for those who can learn, as Gayeski (1992), stated: "to live on the 'leading, bleeding' edge." (p. 12). As a result, we see an increased emphasis on these projects:

- **CAI Packages**
  In the immediate future, CAI programs will be provided on disk in an MS-DOS format and later in the MAC format. Eventually, similar lessons will be provided online for easier access and revision. These programs will be used to increase the amount of instructional time provided to students; some programs will be provided for enrichment activities. We are currently beginning this project in the Research and Evaluation study area in which students indicate they need the most support.

- Videotapes
  The use of videotapes will be further expanded so tapes are available in all curricular areas. The approach used in these tapes will be increasingly interactive; students must perform various activities during the viewing of the tapes and as follow-up activities. Online conferences may be planned to follow-up the viewing of selected tapes.

- Audiobridge Use
  Although very expensive, the audiobridge is currently being used in the Human Development study area. Its use will be expanded to the Research and Evaluation area, but for shorter periods of time by combining it with the use of the less expensive, computerized, ecr sessions.

- CD-ROM
  We will become more involved in the production of CD-ROM discs or their successor so that students can enjoy full multimedia CAI in their homes as part of their degree work.

As emerging technologies become more affordable, we will incorporate their use into the program. As costs become lower, direct home access will be even more feasible than it is today. The development of affordable multimedia personal computers (MPCs) that include support for CD-ROM, digitized audio and high-resolution graphics (connected by optical fiber for full two-way video and audio connections) is not far in the future. When available at a reasonable cost to the public, MPCs will provide an even greater opportunity for interactive educational programs to supplement the data exchanges we enjoy today.

The computer-based, distance education component of the Ed.D Program in Child and Youth Studies is still in its infancy. Relatively small numbers of students and faculty have participated in the program to date. However, the impact made on these students has already been significant and the approach being used has become the starting point for other programs as they begin to move into the use of high tech delivery techniques. Bugs still need to be worked out of the delivery and training system. The research upon which we have embarked should begin to provide important answers for us in the near future.

Certain advantages have already been noted. In one instance, a student on the west coast sent work by email to his adviser on the east coast and received the adviser's review within 24 hours. The student then made the necessary corrections and two days later sent the revised work to the adviser. The adviser was attending a conference, but had brought along a laptop with a modem — the student received approval the following day. Normal time for this process using regular mail would have been increased by at least an additional 10 to 12 days.

National Cluster members appear to communicate with faculty and each other more frequently than students in the traditional site-based clusters. Certainly, ease of communication is one element. We must also consider that, because the program is new, we may be experiencing a Hawthorne effect that will disappear with time.

Nova University recognizes the urgent need to provide better access to education for adult learners, especially as the gap between the necessary job skills and the education of the adult population increases. The increased mobility of our society adds another dimension to that problem.

It is vital that we keep abreast of delivery modes that can provide quality education and that will also be cost-effective for student and university alike. It is also important to recognize that there is no *super medium*. A consensus of best instructional strategies recommends that a wide range of media incorporated in a planned and integrated manner will provide the optimum variety of educational approaches (Moore, 1987). Spikes (1990) is convinced that the "training organization of the future, the classroom of the future, the education of our citizens of the future will be technologically driven" (p. 14). Distance learning through the use of appropriate technology is a growing field. The future is wide open, and Nova University plans to continue to be one of the forerunners.

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